

APPENDIX J

**LIMITED TRAFFIC IMPACT ANALYSIS
INTERNATIONAL SPACE RESEARCH PARK (ISRP)
BREVARD COUNTY, FLORIDA**

Limited Traffic Impact Analysis
INTERNATIONAL SPACE RESEARCH PARK (ISRP)
Brevard County, Florida
April 2003

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EXECUTIVE SUMMARY

Analysis of the traffic impacts to the roadway network accessing Kennedy Space Center created by the proposed International Space Research Park (ISRP) revealed that the additional traffic generated by the ISRP does not create any critical violations of traffic level of service standards.

SR 3 (N. Courtenay Parkway) between SR 528 (the Beeline) and Hall Road reached critical levels in the full buildout horizon year (2022) based upon the FDOT Generalized Tables, but more data intensive site specific analysis reveals sufficient capacity along the corridor due to the limited number of signalized intersections and the low side street volumes.

In order to maintain acceptable levels of service in the 2022 postdevelopment scenario, with the existing roadway geometry, the traffic signal timing at the existing intersection of SR 3 and Hall Road would need to be increased to unusually long cycle lengths. An alternative to the long cycle lengths would be to add, as a minimum, an exclusive right turn on Hall Road to accommodate westbound to northbound right turning vehicles.

INTRODUCTION

Motorist Design of Merritt Island, Inc. (Motorist Design) was contracted by Dynamac Corporation (Dynamac) to conduct a traffic study that extends from the boundaries of KSC south to the intersection of SR 3 and SR 528 and west from the Badging Station on NASA Causeway to the Space Coast Executive Airport on SR 405.

Based upon the May 28, 2002 Development Study Report, the baseline employment projections for the site would be 2,329 in 2010, and 7,655 in 2022.

As the two alternate sites are both in the same general vicinity, for the purpose of this report, off site impacts to the surrounding roadway network would be equal for either scenario.

EXISTING AND PROPOSED CONDITIONS

Both of the proposed locations are remote to any urban area but proximate to the existing Kennedy Space Center.

In conjunction with the proposed ISRP, Space Commerce Way construction will be completed and will allow unrestricted access between SR 405 and SR 3.

The existing Visitor Center entrance is proposed to be relocated from direct access to SR 405 to the proposed Space Commerce Way.

Space Coast Area Transit (SCATS) currently has over 30 vanpools to KSC and Cape Canaveral Air Force Station. Scheduled routes have increased ten percent per year in recent years. SCATS authorities state that they would like to continue the recent growth rate, but that funding is not available.

SR 405:

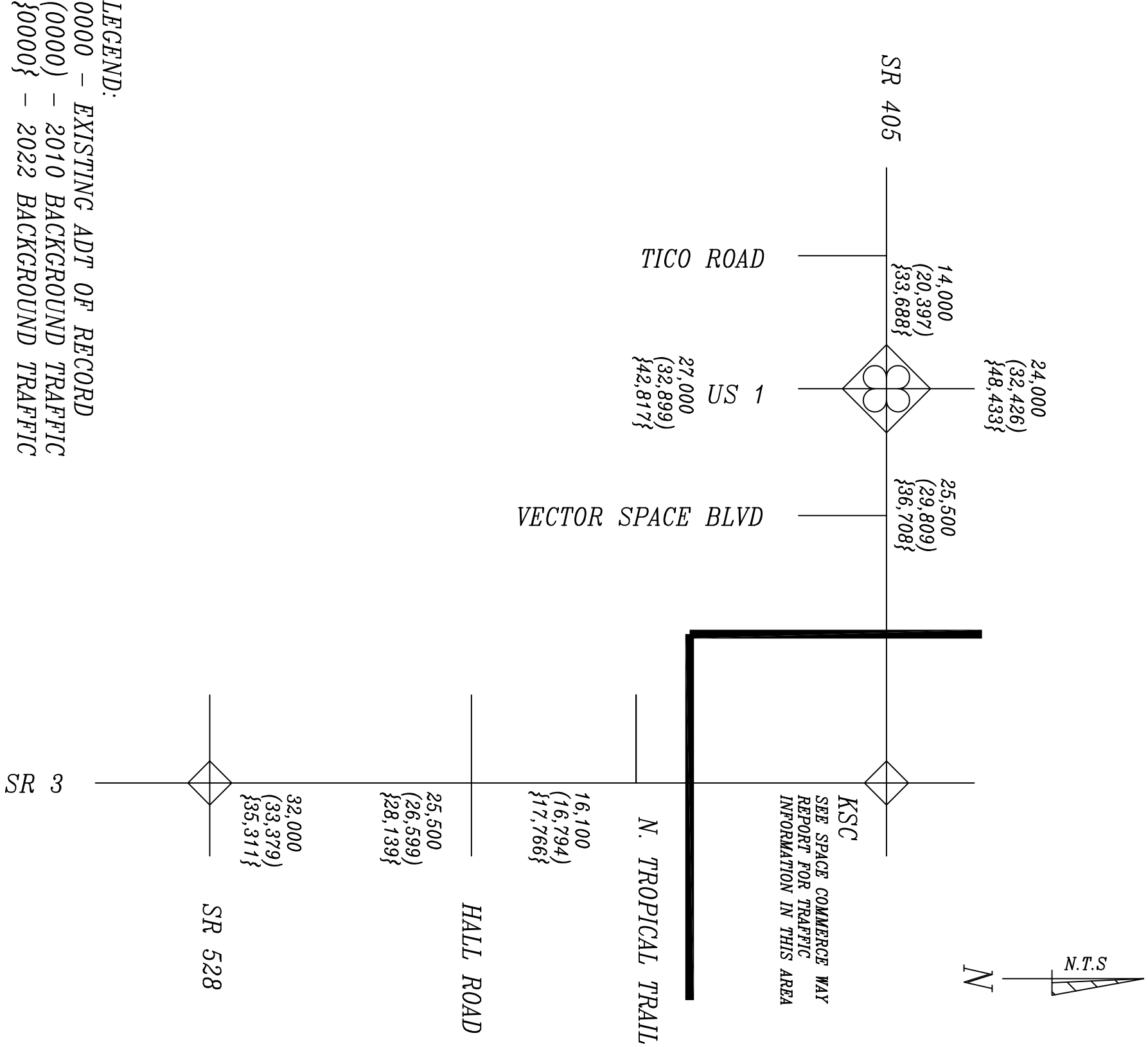
Within the study area, SR 405 is a limited access four-lane divided roadway with a current average daily traffic volume ranging between 14,000 trips west of US Highway 1 and 25,500 trips east of US Highway 1. The roadway is currently operating at level of service "B" throughout the corridor, based upon the FDOT generalized tables. See Figure 1.

SR 3:

A four-lane divided roadway, SR 3 currently accommodates between 16,100 average daily trips south of its intersection with Tropical Trail, on north Merritt Island, to 25,500 trips south of Hall Road, and to 32,000 north of the SR 528. The roadway currently operates at level of service "B" in the two north sections and level of service "C" in the south section, base upon the FDOT generalized tables. See Figure 1.

US 1 (SR 5):

Also a four-lane divided roadway, US 1 has an existing average daily traffic volume of 24,000 trips north of SR 405 and 27,000 south of SR 405. Along this rural section of highway, the arterial currently operates at level of service "B", which is the best attainable level of service for a roadway of its classification. See Figure 1.



AVERAGE DAILY TRAFFIC
FIGURE 1

DATA COLLECTION AND ANALYSIS METHODOLOGIES

Methods used in the analysis were based upon standards outlined by the Florida Department of Transportation (FDOT) primarily in Manual on Uniform Traffic Studies, 2002 Quality/Level of Service Handbook, and Generalized Q/LOS Tables, by the Federal Highway Administration (FHWA) primarily in Manual on Uniform Traffic Control Devices Millennium Edition, by the Transportation Research Board National Research Council's Highway Capacity Manual Special Report 209, and by the Institute of Transportation Engineers (ITE) primarily in Trip Generation, 6th Edition, and Trip Generation Handbook, An ITE Proposed Recommended Practice.

Background traffic projections for roadway segments were based on the most current FDOT traffic counts of record for average daily traffic and the volume projections identified in the Brevard County MPO's "South Titusville Subarea Traffic Analysis Summary Report," March 21, 2003. 2010 and 2022 predevelopment volumes were interpolated / extrapolated respectively. See Figure 1.

Background traffic projections for peak hour turning movement counts were based on turning movement counts performed by Motorist Design in early 2003 and extrapolated to 2010 and 2022 predevelopment conditions based upon rates backed out of the Brevard County MPO's "South Titusville Subarea Traffic Analysis Summary Report," March 21, 2003. Existing peak hour volumes and predevelopment projections for the individual intersections are identified on the intersection analysis summary sheets and turning movement counts contained in the appendix of this report.

TRIP GENERATION

Trip generation for the proposed site was based upon the methodologies outlined in "Trip Generation, Sixth Edition", 1997. The Land Use Category 760, Research and Development Center was determined to be the closest match to the proposed ISRP.

AVERAGE DAILY TRAFFIC

2010 2,329 employees = 6,451 average daily trips
2022 7,655 employees = 21,204 average daily trips

AM PEAK HOUR TRAFFIC

2010 2,329 employees = 1,001 morning peak hour trips
861 entering, 140 exiting
2022 7,655 employees = 3,292 morning peak hour trips
2,381 entering, 461 exiting

PM PEAK HOUR TRAFFIC

2010 2,329 employees = 955 afternoon peak hour trips
95 entering, 860 exiting
2022 7,655 employees = 3,139 afternoon peak hour trips
314 entering, 2,825 exiting

In an effort to create a worse case scenario, no trip reduction allowance was made for multipurpose trips (e.g. a worker attending a class directly from work).

TRIP DISTRIBUTION

Trip distribution percentages in the immediate vicinity of the site were based on the distribution rates indicated in "Updated Space Commerce Way Traffic Study," September, 2002, by Buckholz Traffic. Buckholz identified that 49% of the morning site traffic and 51% of the afternoon traffic would access the area via SR 405 west of the Space Center and that 49% of the morning site traffic and 39% of the afternoon traffic would access the site via SR 3 south of KSC. The average annual distribution was based on the average of the am and pm distribution percentages. See Figure 2.

Distribution rates outside the Space Center were generally based upon existing traffic patterns during morning peak hours. It was assumed that proposed traffic accessing the ISRP via SR 3 or SR 405 would be distributed similarly to those currently accessing KSC. The one exception, was for trips utilizing the full interchange to access via US 1. Trip distribution for US 1 was based on the capture rates indicated in the Brevard County MPO's "South Titusville Subarea Traffic Analysis Summary Report," March 21, 2003. See Figure 3 for distribution of site trips accessing SR 405 and Figure 4 for distribution of site trips access SR 3.

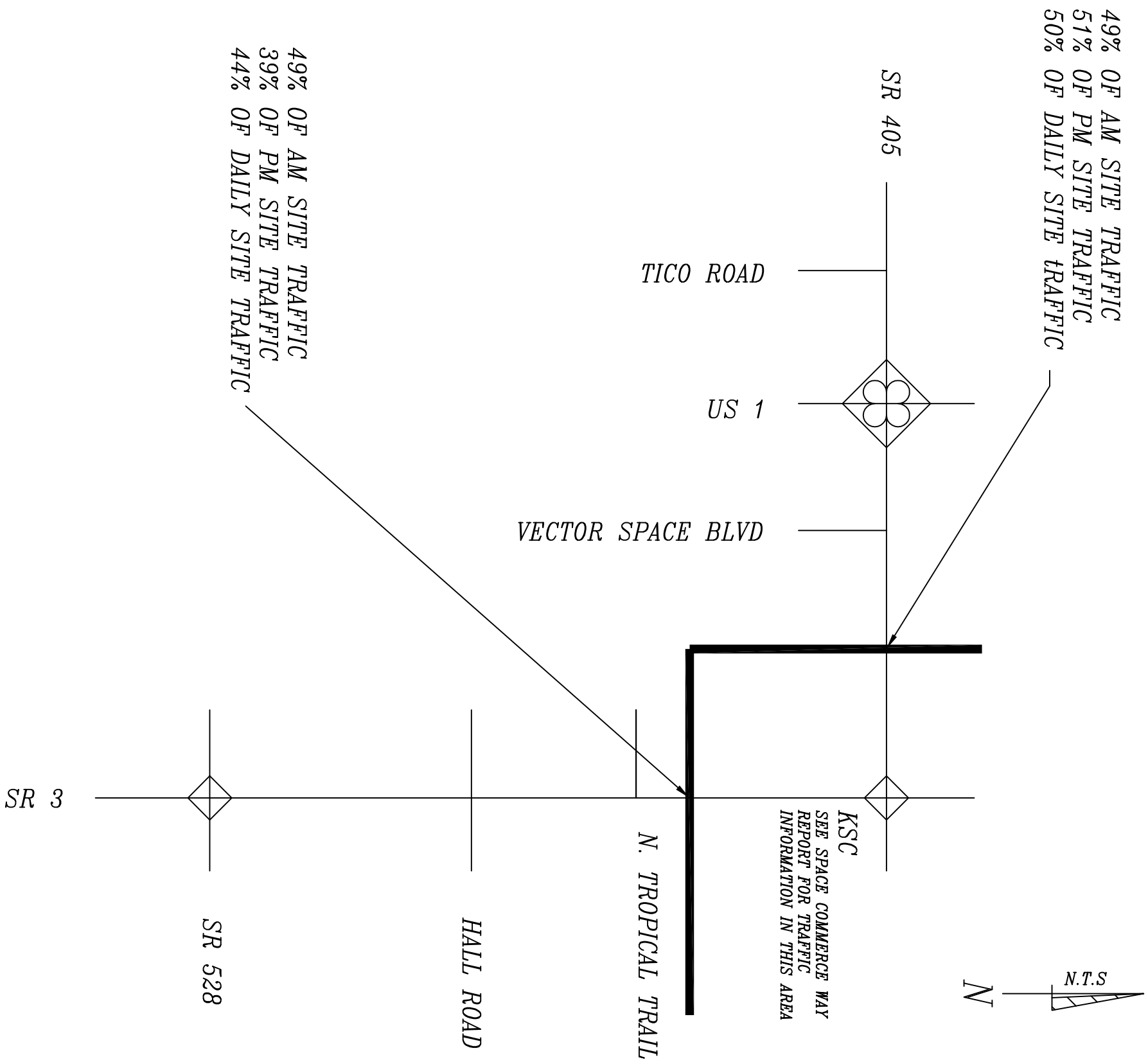
It was assumed that of the trips accessing the ISRP via SR 405:

- 5% would travel to/from Vectorspace Boulevard
- 19% would travel to/from the north on US 1
- 19% would travel to/from the south on US 1
- 1% would travel to/from Tico Road
- 56% would travel to/from the west on SR 405, west of Tico Road

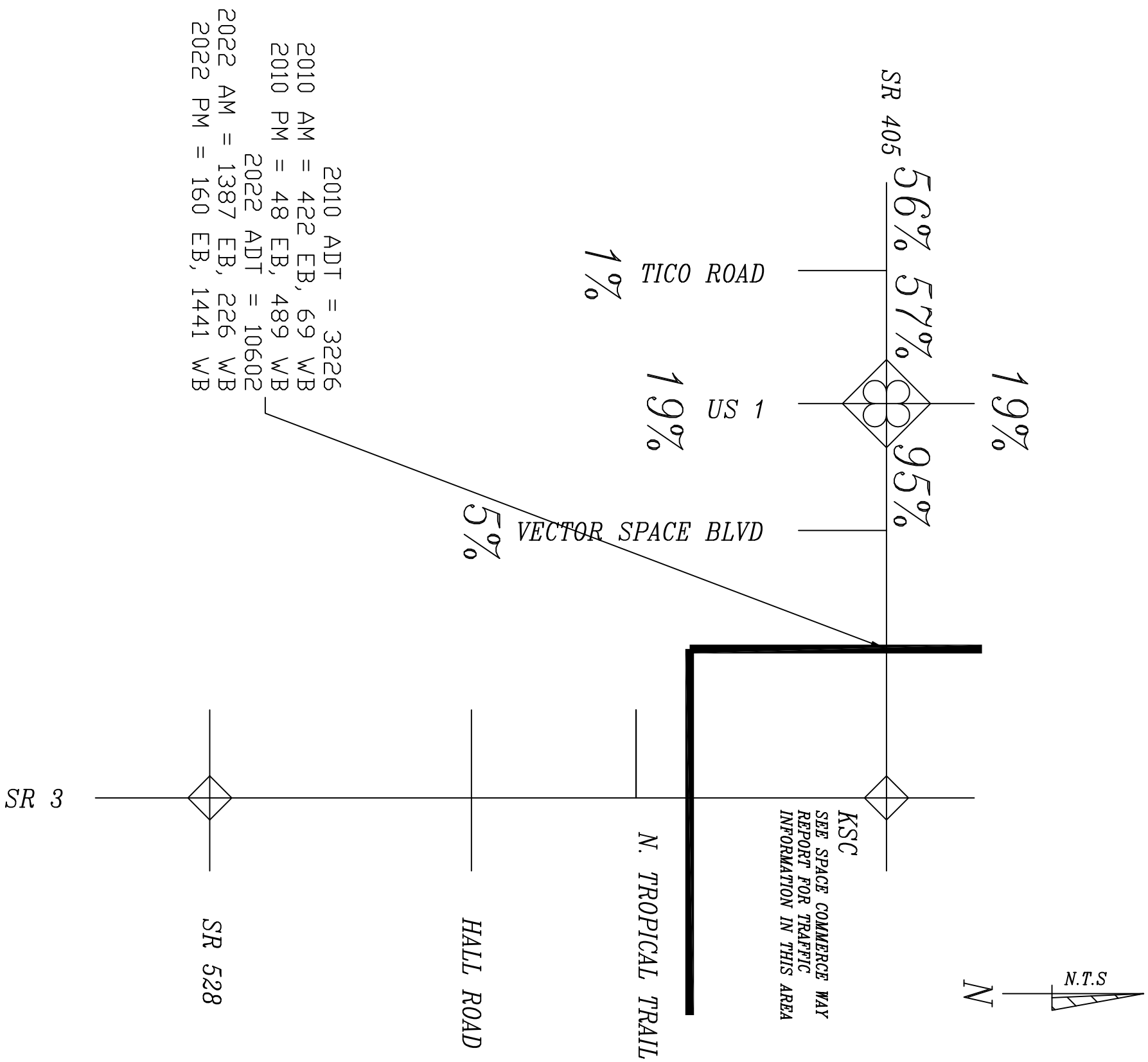
It was assumed that of the trips accessing the ISRP via SR 3:

- 2% would travel to/from N. Tropical Trail
- 2% would travel to/from the west on Hall Road
- 3% would travel to/from the east on Hall Road
- 25% would travel to/from the west on SR 528
- 16% would travel to/from the east on SR 528
- 47% would travel to/from the south on SR 3, south of SR 528

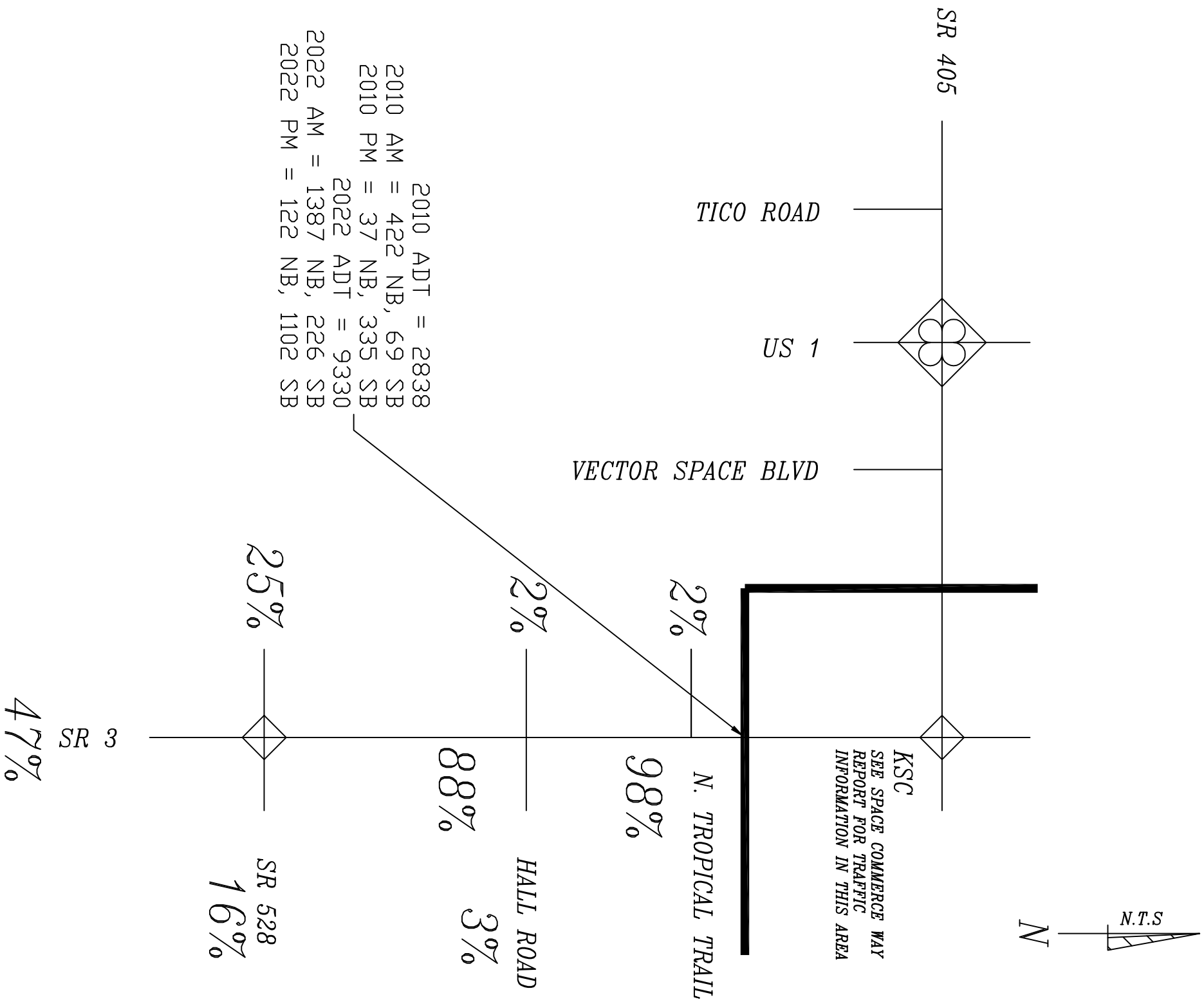
the remainder of the traffic accessing the site via SR 3 would be absorbed into the areas adjacent to SR 3 along the corridor. See Figure 4.



GENERAL DISTRIBUTION BY PERCENT
FIGURE 2



WEST AREA TRIP DISTRIBUTION
FIGURE 3



SOUTH AREA TRIP DISTRIBUTION
FIGURE 4

CAPACITY ANALYSIS

Initial capacity analyses for the roadway segments were based upon "Level of Service Standards and Guidelines Manual", published by the Florida Department of Transportation. More detailed analysis based upon the methodologies indicated in the "Highway Capacity Manual," was then performed on the south end of SR 3 for 2022 postdevelopment conditions. The following tables outline the results of the initial analyses:

Roadway Segment	2010 Predevelopment	2010 Postdevelopment
SR 405, east of Tico Road	LOS B	LOS B
SR 405, east of US 1	LOS B	LOS B
SR 405, east of Vector Space	LOS B	LOS C
US 1, south of SR 405	LOS B	LOS C
US 1, north of SR 405	LOS B	LOS C
SR 3, north of Hall Road	LOS B	LOS B
SR 3, south of Hall Road	LOS B	LOS B
SR 3, north of SR 528	LOS C	LOS F

Roadway Segment	2022 Predevelopment	2022 Postdevelopment
SR 405, east of Tico Road	LOS C	LOS C
SR 405, east of US 1	LOS C	LOS C
SR 405, east of Vector Space	LOS C	LOS C
US 1, south of SR 405	LOS D	LOS D
US 1, north of SR 405	LOS D	LOS D
SR 3, north of Hall Road	LOS B	LOS C
SR 3, south of Hall Road	LOS B	LOS E
SR 3, north of SR 528	LOS D	LOS F

A more data intensive analysis of the section of SR 3 north of SR 528 was performed based on Transportation Research Board guidelines and was found to operate at acceptable levels even under 2022 postdevelopment conditions. The nature of the roadway as a north/south corridor on a north/south oriented island creates a condition with very limited volumes on the side streets and the substantial distance between traffic signals along the corridor creates greater capacity along the roadway than what is identified in the FDOT generalized tables that were used in the initial analysis. As the detailed analysis was more specific to the corridor, it was determined to be more accurate. See the appendix of this report for the detailed analysis.

Capacity analyses for the intersections were based upon the methodologies outlined by FHWA and FDOT. The following table summarizes the results of the intersection analyses. Summary reports of each analysis are included in the appendix of this report.

Intersection	am/pm 2010 Predevelopment	am/pm 2010 Postdevelopment
SR 405 @ Tico (unsignalized)	acceptable/acceptable	acceptable/acceptable
SR 405 @ Vectorspace (unsignalized)	acceptable/acceptable	acceptable/acceptable
SR 3 @ SR 528 EB (signalized)	LOS C / LOS D	LOS C / LOS D
SR 3 @ SR 528 WB (signalized)	LOS B / LOS B	LOS B / LOS B
SR 3 @ Hall Road (signalized)	LOS C / LOS B	LOS C / LOS B
SR 3 @ N. Tropical (signalized)	LOS A / LOS B	LOS B / LOS C

Intersection	am/pm 2022 Predevelopment	am/pm 2022 Postdevelopment
SR 405 @ Tico (unsignalized)	acceptable/acceptable	borderline/acceptable
SR 405 @ Vectorspace (unsignalized)	acceptable/acceptable	borderline/acceptable
SR 3 @ SR 528 EB (signalized)	LOS C / LOS D	LOS C / LOS D
SR 3 @ SR 528 WB (signalized)	LOS B / LOS B	LOS D / LOS E
SR 3 @ Hall Road (signalized)	LOS C / LOS B	LOS E / LOS C
SR 3 @ N. Tropical (signalized)	LOS A / LOS B	LOS B / LOS D

The unsignalized intersections of SR 405 at Tico Road, and SR 405 at Vectorspace Boulevard each demonstrate substantial delays for northbound to eastbound turning movements during the morning peak hour under 2022 postdevelopment conditions. Both of the intersections, however, have nearby alternate routes that would re-route traffic through the full cloverleaf interchange at US 1 and SR 405 where the vehicles would experience much shorter delays. Typical driver behavior would be that the traffic congestion would begin to self-correct by some of the vehicles using the interchange instead of the unsignalized intersections. Neither of the intersections would meet traffic signal warrants as they are both “T” intersections with no left turns permitted from the side streets. Both of the intersections are already provided with right turn acceleration lanes that assist the vehicles merging into the eastbound through lanes. The unsignalized analyses contained in the appendix for these intersections do not adequately adjust for the acceleration lanes and therefore identify unrealistically high delays for these movements. The actual delays projected for the northbound to eastbound right turning vehicles would be less than the delays identified in the appendix.

In order to maintain acceptable levels of service at the intersection of SR 3 and Hall Road with the existing lane geometry, unusually long signal cycle lengths will ultimately be required. In the 2010 postdevelopment analysis, the cycle length only required minor increase, but by the 2022 postdevelopment condition, the cycle lengths required with existing geometry were extremely long. A better solution, if feasible, would be to add an exclusive right turn lane to the east approach to the intersection. An exclusive right turn lane on the west approach would also add more capacity to the intersection, but to a lesser extent than one on the east approach.

Delays initially observed at the intersections of SR 3 and the SR 528 ramps were later determined to be caused by temporary traffic signal timing. The signal timing has since improved and the intersections are operating efficiently once again.

The interchange at SR 405 and US 1 is a full cloverleaf interchange. No movements are required to make left turns. The interchange was therefore not analyzed as no delays were anticipated.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the preceding traffic review, the roadway system in the vicinity of the site can generally accommodate the new traffic generated by the project without severe degradation to level of service.

It is recommended, however, that consideration should be given to intersection improvements at the intersection of Hall Road and SR 3. Improvement to consider should include an exclusive right turn lane for westbound to northbound right turns, and possibly an exclusive right turn lane for eastbound to southbound right turns.

Consideration could also be given to the feasibility of development of a residential area, just south of the KSC off of SR 3, that would be specifically designed to attract workers from the ISRP and the existing Space Center. Amenities such as wireless network, T-1 lines, a reprographics center and other high tech capabilities in addition to normal amenities could be used to help attract employees and encourage telecommuting. If the residential development were not large enough to warrant a traffic signal, it should be placed ideally east of SR 3 in order to facilitate traffic movements.

Efforts should be made to increase the number of vanpools currently serving the Space Center area.